OADSTAR LETS

Number 32. Companion the LOADSTAR disk #142

Just when You Thought You Were "Compleatly Safe," LOADSTAR Launches

Two New Software **Titles**

LOADSTAR proudly introduces two new titles in our Compleat series: The Compleat Crossword and a new game disk, The Compleat Jon. The Compleat Crossword is a major collection of 220 crossword puzzles found in Puzzle Page on LOADSTAR.



From a handy scrolling menu you can select any of the puzzles and then solve them on screen with Barbara Schulak's Cruciverbalist program. When done with the puzzle you have the option of "marking" the puzzle as one that's solved.

Compleat Crossword is a testament of digital cooperation, compiled by Bill Calvert, Presenter by Fender Tucker, and Puzzle Program by Barbara Schulak. The myriad of puzzles were crafted by Barbara Schulak, Fender Tucker, Craig Buchman, Linda Vano, Peter Rokitski and Knees Calhoon Music by Dave Marquis. You can even select which of the nine songs you'd like to hear while solving the

The Compleat Jon, The Games of Jon Mattson, is a collection of 11 superb games previously published on LOADSTAR. During



LOADSTAR's "middle years" (1987-1990) one programmer stood out from the crowd because of the sophistication of his programs -- Jon Mattson. Practically every month he would send LOADSTAR his latest creation, which usually used the most modern techniques of game programming.

The whole gamut of gaming is covered

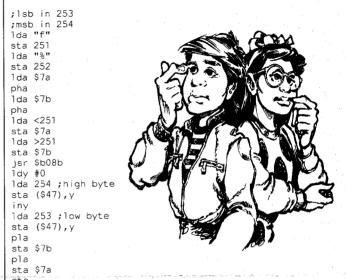
here: artificial intelligence, role-playing, mazes, fantasy, science fiction, education and even non-violence (which was a radical concept in its time).

The thing I like best about the games is that each takes place in a consistent, realized world of its own. Read the docs, which are all by Jon himself, to get the background story behind each game.

These are not silly little games made with character graphics; they are games with backgrounds and stories, and Jon tells these stories very well, indeed. By the time you finish the docs, you are in the created world, and once you run the program you are the hero, with lives depending on you and your cleverness and dexterity.

Things That Make You Go "Hmmm...

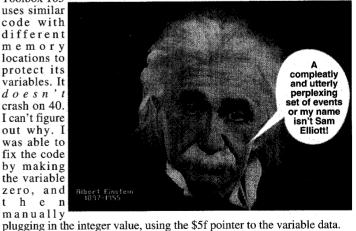
by Jeff Jones. While developing The Compleat Crossword, Fender stumbled upon a bug in my [Jeff] code that causes a crash whenever following 6502 code creates an integer variable, F%, with a value of 40.



This code was handed down to me from C-64 programming legend, Rick Nash. I'll admit that I've mutated the code a bit. I use this code all the time to pass data back to BASIC from my machine language routines. I used this code in Menu Toolbox, which Fender used in Compleat Crossword. When Fender selected the 40th item on the crossword menu, the program crashed with a syntax error. I studied the code and found nothing that should be agitated by a value of 40. I plugged in a 40 and assembled the code by itself. Crash! What's more weird,

Toolbox 105 uses similar code with different memory locations to protect its variables. It doesn' crash on 40. I can't figure out why. I was able to fix the code by making the variable zero, and t h e n

manually



I found the pointer by locating a variable in memory, and then using Super Snapshot V5.5.2's machine language monitor to search for any zero page locations pointing to the variable. Though this bug is squashed, I can't help but wonder what could have caused such a thing to happen. Hmmm. Anyone have any ideas?

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LOADSTAR is a monthly "magazine on disk" for the Commodore 64/128. Subscribers receive two 1541 disks (or one 1581 disk) in their mailbox every month packed with news, ancies and programs. These non-PD, high-quality programs are written by the best home based programmers in the field and edited by the crack LOADSTAR learn of Fender Tucker and Jeff Jones. Subscription prices are at an all-time low of \$59.95 for a 12-month subscription, or \$1.95 for a fines-month subscription. You may also elect to subscribe "by the month," where we charge your credit card \$7.35 for each issue after it's shipped. We also offer the long line of standalone products below.

✔NEW Games Disk! The Compleat Jon: 11 Games! The

whole gamut of gaming is covered here: artificial intelligence role-playing, mazes, fantasy, science fiction, education and even non-violence (which was a radical concept in its time) These eleven games are among the best ever published on LOADSTAR. Listed on the menu in chronological order, so you can see how Jon's style changed as the years rolled by. 1581 disk 0021D3 \$20. 1541 disk #0038D5 \$20



✔ NEW Puzzle disk!

The Compleat Crossword: Every

crossword puzzle published in Puzzle Page in one huge collection! 220 puzzles! It uses Barbara Schulak's CRUCIVERBALIST program to present the puzzles and allows you to "mark" a puzzle when it's solved so that you know which you've solved and which you haven't yet. Each 1541 disk contains 110 puzzles. 1581 Disk #0020D3 \$20. Disk 1 (1541) #0036D5 \$10.Disk 2 (1541) #0037D5 \$10

ไท่ โดย เลือง เล Lee O. Clinton's best serious programs for the C-128 80- column mode. Finance, auto expense, kitchen helper, genealogy, resume writing, mutual funds! One 1541 disk #0032D5. One 1581 disk #0017D3 \$10.00

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Over 1300 artistic and never before published PRINT SHOP images. Scan through the many PRINT SHOP images sequentially, by name, or by group number. Press a key and save the graphic you want in 2-block, 3-block and even PRINTMASTER graphic filles! All that plus a printed guide! Each volume is \$20.00. Vol. 1: C-64/128 3.5-inch disk item #0001d3. 5.25-inch disks item #0009d5. Vol. 2 (graphics from past LS issues): C-64/128 3.5-inch disk item #0010d5.



LOADSTAR presents the biggest Geos collection of clip art and fonts ever offered at one time. All of the Geos art that's ever appeared on LOADSTAR, as well as some great files from Geos tanatic Dick Estel, are available on twenty 5.25 inch disks or eight 3.5 inch disks. Most of this has never been seen before! Use these graphics in your GeoPaint, GeoWrite and GeoPublish documents or convert to FGM with FGM utilities. Spiff up your GeoFAX documents with the appropriate graphic -- every time! Prices are \$20 for any two 3.5 inch disks, or any five 5.25 inch disks. You can purchase the whole collection for \$75 for either version. Call LOADSTAR toll-free at 1-800-594-3370 or 1-318-221-8718 to order by credit card. Or send check or money order and credit card. Or send check or money order and specify (by LG number) which disks you want.

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Disk 09 - GOODYKOONTZ FILES - Jasper Goodykoontz, born in Indiana in 1855, produced Goodykoontz's Perpetual Calendar and General Reference Manual (A Book for the Millions). This disk includes scans from the book of a wide array of subjects -- Gestures and Attitudes, Poultry, Craniology, and more. #0020D5

Disk 10 - OLD WEST: Scanned Artwork from Dick Estel's FRD Software - mostly woodcut style art of the old west, gold rush days and pioneer cenes. #0021D5

N e e l y Art/Animals: Jennifer Neely works with a wide variety of

with a wide vallety of subject matter and materials. Disk contains some of her favorites, scanned into geoPaint format. Side 2 is a collection of scanned artwork of animals from FRD Software #0022D5

Disk 12 - HOLIDAY: Artwork for New Years, Valentine's, St. Patrick's Day, Halloween, Thanksgiving and Christmas #0023D5

Disk 13 - PEOPLE/FACES: Scenes of people and faces from FRD Software #0024D5

Disk 14 - FRD CLASSICS: Dick's choice of the best of the FRD collection #0025D5

Disk 15 - DINOS/CLASSICS: Dinosaurs and other prehistoric beasts, as well as more first choice artwork from FRD. #0026D5

Disk 16 - SPORTS/MISC: Dozens of sportsrelated clips #0027D5

Disk 17 - OFFICE AND SCHOOL: Clips to be used at work and around the house #0028D5

Disk 18 -146 - CLIPS #0029D5 isk 18 -MUSIC & MORE SCHOOL

Disk 19 - SEASONAL AND HOLIDAYS: A clip for any occasion #0030D5

Disk 20 - SEASONAL AND HOLIDAYS: A clip for any occasion #0031D5

The 3.5" disks are roughly equivalent to two half 5.25" disks. disks are roughly equivalent to two and a

Disk 1: Equals disks 1, 2, 4B #0009D3 Disk 2: Equals disks 3, 6, 7A #0010D3 Disk 3: Equals disks 5, 8, 7B #0011D3

Disk 4: Equals 9, 10, 11A #0012D3 Disk 5: Equals 12, 13, 11B #0013D3 Disk 6: Equivalent of Disks 14, 15 and some bonus files not on 5.25" disks #0014D3 Disk 7: Sports, Office and school, Music #015D3

Disk 8: Music, Holiday and Seasonal #016D3 For your convenience, GeoViewer is

included on each volume. GEOS 2.0 is suggested.

Diskiulla Card Games! The Compleat Maurice: A compilation of 26 solitaire card games written by Maurice Jones, the acknowledged master of card game simulations for the C-64/128. There's even a brand new, never before published game called Boomerang. **Two 5.25** inch disks #0007D5 or one 3.5 inch disk #0007D3. \$20.00 postage paid!

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Questions: 1-318-221-8718

Xnet, The Newest Commodore BBS Network

If you are currently running an Image BBS and want to join a network then look no further! JOIN XNET!! Just leave feedback (not Email) on the LOADSTAR BBS at 1-318-425-4382, saying that you wish to join! We would love to have you in our network!! No harsh rules! Just a bunch of Sysops having FUN!

Jeff's Eight Inches
On the LOADSTAR LETTER #25, I slammed the STAR SJ-144 color printer. I got one letter in its defense last fall. For the way the writer used the printer (a cool color graphic covering 20% of the paper in the middle of text), it seemed to have decent output. It still doesn't stack up to modern color ink jet printers. The Star SJ-144 isn't history because Jeff doesn't like it. It's history because it doesn't stack up. And how dare they call it "laser quality." It's hard enough to keep a straight face when you call a serious ink jet printer "laser quality."

Frank Vanaman wrote me, informing me that the Casio digital camera's 320x200 resolution wasn't sufficient for stunning photos, and that it was unfair to compare it with the scan of Fender and Judy in the LOADSTAR T-shirt ad. He also informed me that the 16 million color photos can make a photo look real at first glance, but at 320x200 pixels,

you can still see the lack of detail.

I agree. Also one thing some people don't understand about "16 million color pictures" is that a 320x200 image only has 64,000 pixels, and if each were a different color, it would only be a 64,000 dot picture. THere are 16 million colors available in a 24-bit picture. I just left Kroger where I perused a Modern photography. They asked if digital photos would overtake 35mm. They did side-by-side comparisons of digital cameras, including the Casio QV-10, and all the digital cameras paled to old fashioned 35mm cameras. To ad insult to injury, they took a picture with a lowly disposable camera, then scanned it, and came up with a

But there was a line of professional digital cameras that ranged from a few thousand to \$27,000, which took beautiful sharp photos at more than 1000x1000 pixels. I was impressed. Maybe in ten years, I can get a camera like that for a few hundred. Until then, digital artists with non-corporate budgets will continue to rely on "real" film cameras. I'm looking at a good focusable Polaroid camera for use with my scanner.

While editing a program this month, I came upon an interesting way to mix Commodore uppercase graphics with Upper/lowercase text on a Commodore printer. Open two channels to the printer. Open4,4,7:open5,4,0. Print#4 for text and print#5 for graphics. Why had I

never thought of it?

I got a piece of Email, stating that LOADSTAR pushes CMD drives, but doesn't support them fully. My answer to that is that is simple: We support CMD drives in the best way possible -- by making our programs compatible, and making them run on any device number when possible. CMD designs their drives and RAM devices to be so transparent, it's difficult to think of a way to support them specifically except for partition and subdirectory surfing. I use all sorts of programs to navigate CMD devices. These programs weren't necessarily designed to be used on a CMD device.

If the program uses or creates files, it will either allow the sending of disk commands or long filenames. That's all I need for CMD support. It's one reason why I never ordered the HD version of TWS. My old

version of The Write Stuff works fine on my RAMLink.

Again, LOADSTAR's main reason for pushing the FD-2000 is that one day there will be no 1541s in working order. That, and there will be no more new 5.25-inch disks. Can you imagine LOADSTAR falling because it's loyal readers had no way to RUN its software?

A Commie Uprising: Internet Service Provider Revolt

"Internet Access And You" By: X-> MIKE <-X @ DMB The basic unit of computing is the BIT... a state determined by an ON voltage and an OFF (or null) voltage. The basic unit of networking is to transmit one bit from computer A to computer B. 8 bits make up one byte, which is equivalent to one character/letter on your screen. The 'internet' is just a collection of many networked computers. 'Internet' connectivity is highly variable, from real-time supercomputer connections to even Coca-cola machines (yep!)

The WORLD WIDE WEB is NOT the 'Internet'. It simply uses the

Internet as a carrier. A good analogy is to say "my boat is the ocean". No, it is not! Your boat simply rides on the ocean.

USENET is NOT the 'Internet'. It also uses the Internet as a

The 'internet' is just a collection of many networked computers.

You DO NOT need 'THE WAVE' to access the 'Internet'. You MAY need 'THE WAVE' to access the GRAPHICAL portion of the WORLD WIDE WEB. You certainly do not need 'THE WAVE' to access the TEXTual portion of the WORLD WIDE WEB.

The WORLD WIDE WEB is just a filesystem! Any vt-100

capable term program should be sufficient for internet connectivity as vt-100 (and in reality, pure ascii) is the primary currency for information interchange in the known world. If your internet provider refuses to acknowledge this, find another provider.

Q From Caped Crusader: I don't see why we can't eventually hook up our Commodore boards with Telenet and folks could call a Commodore 8 bit board using the Internet. --

A: Telnet... telEnet was (is?) an old and hopefully-now-obsolete and useless network that charged you up the wahzoo for... err,

wow...slow down Mike..

I have done what you propose. I 'telnetted' a DIAL-OUT and had it call a local BBS. To be more precise, Highlander BBS in Toronto (416). Also, some guy put his BBS on the net, in a matter of speaking. He has a pc running linux acting as a go-between for the commodore. The BBS is so-so and the connection is no different than the DIAL-OUT idea (in essence you use a more pro-actively connected machine to spoon feed the commodore). What I am waiting for is an actual TCP/IP stack for the Commodore itself, which would allow it what I consider 'true' internet connectivity. It's like the difference between running a basic program and claiming you program in machine language (essentially you do, since basic is written in ML:) and actually getting down and doing ML.

PS: DO NOT ASK ME FOR A DIAL-OUT. THESE THINGS ARE SO POPULAR AND GET ABUSED THEY RARELY LAST

FOR MORE THAN A FEW WEEKS.

Q From Realm Master: You defined the internet as bunch of "networked computers". Well, the Commodore Image network is a bunch of networked computers so would one think that it would be okay to call our CommNet an Internet? By your definition, we are an internet....one may argue that the word "internet" might mean an international network. I guess that qualifies CommNet as an Internet if for no other reason than we have some network nodes in Canada. USA-Canada..international, right? -----

A: God, you said that with loads o sardony... but did you realize just how much truth you were spouting out? The only differences (from a nice 'big picture' view) between our networked C=s and the "internet" are basically that links between machines are usually real-time (well...tries to be) super-fast (compared to our stuff) almost always 100% automated, and the machines themselves are generally serious stuff that would set you back \$20 grand ez. But this is oh-so-general... Every time I connect to my IP server, in effect, my little 128 becomes part of the "internet".. please notice the caveat about "true connectivity' in the reply to CC. XmX

CMD Considered Including Swiftlink In Super CPU. Comments That Utility Cartridges May Work Only In 1 Mhz

From: CMD Sales <cmd.sales@the-spa.com

To: H.Pieters@net.HCC.nl Subject: Re: supercpu.128

Yes, SwiftLink will be compatible with the CPU. CMD is striving to maintain compatibility with as many cartridge port peripherals as possible including RAMLink, SwiftLink, SID Symphony and the EX3/2+1 expander. As for utility cartridges such as Super Snapshot, their compatibility may be limited to 1 MHz modes because of their design and the fact that they take over the Kernal ROM when they are plugged in. And to your second suggestion, the answer is Yes. We did consider a built-in SwiftLink. However, it would have added too much to the units cost and would be a duplication for the many thousands of

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*Add one cycle if page boundary is crossed. For branching, add 2. Each cycle is roughly 1 millionth of a second. In order to use these commands, you need a machine language monitor or preferably an assembler. Both of these are provided in The COMPLEAT PROGRAMMER.

Introduction to 6510 Machine Language

by Jeffrey L. Jones. I originally wrote this article way back when I was new to assembler. Since I was closer to the moment of "eureka" then, perhaps this article is the best way to explain the mysterious commands on these two pages.

The number one reason for writing programs in machine language is speed. A program written in machine language, even if sloppy code is used, can be thousands of times faster than even a compiled BASIC program. But most people, myself included, shudder at the thought of learning how to program in machine language. After all, BASIC was tough, and now that you've mastered it, you have no desire to master another language. Well, machine language is a lot easier to learn than BASIC, especially when you already know BASIC.

Basically you're dealing with memory locations. Everything in a machine language program is concerned with "What's in this location?", "Let's move

that to another location", "Let's increment", "Let's decrement..."

You have three registers, A, X, and Y. Most every operation you do will be through the ACCUMULATOR or A register. This register in your CPU is the ONLY place where mathematics can occur. It also offers the most versatile forms of ADDRESSING. More on addressing soon. Conceivably entire programs could be written without accessing the ACCUMULATOR but I think it would cause high blood pressure problems.

Let's look at a simple, unelegant machine language program that moves lines 2 and 3 to lines 0 and 1 on your screen. All numbers used are in decimal unless a dollar sign precedes them. Most machine language monitors would force you to use HEX, and even if they allowed you to enter decimal with a + prefix would replace the decimal with the proper hex conversion when you hit RETURN. Assemblers allow you to type in the following program as is, without the need of the line numbers. Through the magic of the fact that this ain't a real disassembly listing, you get it both ways.

```
cooo:
          IDY #0
          LDA 1104, Y
C002:
C005:
          STA 1024, Y
C008+
          INY
C009:
          CPY #80
C00B:
          BNE $C002
C00D:
          RTS
```

To write this program, you would need an assembler or a machine language monitor. You would also have to adhere to your monitor's protocol for entering the code. To RUN this program you would SYS 49152 (\$C000) though it's completely relocatable since there are no JMPs or JSRs inside the

Here's a BASIC equivilant:

FORY=0TO79:A=PEEK(1104+Y):POKE1024+Y,A:NEXT

This program will PEEK the screen, starting at location 1104 (line 2) and then POKE it all, one by one, to line 0. The whole process takes 1.288 milliseconds to accomplish, while in BASIC it would take about two thousand times longer to execute -- literally.

The program starts out by LOADING the Y REGISTER with a 0 (in case it was anything else). Now we get to INDEXING: Note the command:

```
LDA 1102,Y is the same as:
        = PEEK (1102+Y)
```

This indexing is called ABSOLUTE, Y. It means you want to PEEK or POKE to Memory Location + Y

Y can be 0-255. So you can start with a base address and index to any of 256 addresses.

STA 1024,Y is the same as: POKE1024+Y, A Again we're using ABSOLUTE,Y indexing, this time to store the data in a different location. We're MOVING 80 bytes to a location 80 bytes lower, 1024 or the start of the default screen.

Next we have the commands:

C008: INY C009: CPY #80 BNE \$C002 C00B:

These three commands are the equivalent to NEXT in BASIC. INY increments the Y register. If Y is incremented past 255, it rolls over to zero.

CPY compares Y to the number 80 or the limit-1 of our loop.

BNE \$C002 is coupled with the previous command. If the comparison of Y to #80 hasn't occurred then BNE (BRANCH IF NOT EQUAL) to \$C002, which is the start of the loop. The BASIC command, NEXT does the same thing: Increments a variable, checks the variable against a limit, then branches to the beginning of the loop if the limit hasn't been met.

Finally we come to RTS, which is the same as the BASIC RETURN. RTS is short for RETURN FROM SUBROUTINE. Since you will more than likely SYS to this program from the immediate mode, RTS will RETURN to the immediate mode; the same as if you GOSUB to a BASIC subroutine from the immediate mode.

Besides vastly greater speed and more compact code, machine language offers more logical operators than BASIC. With BASIC you can basically branch if:

```
equal: IF A=X THEN...
less or equal: IF A<=THEN...
greater or equal: IF A>X=THEN...
                                               not equal: IF A<>X THEN...
                                               less than: IF A<X THEN
                                               greater than: IF A>X THEN...
if not 0 (true): IF A THEN...
```

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| But in ML you get more: | |
|-----------------------------|------------------------|
| if equalBEO | if zeroBEQ |
| if not equalBNE | if not zero (true)BNE |
| if less or equalBCC | if less thanBCC |
| if greater than or equalBCS | if greater thanBCS |
| if negativeBMI | if greater than 127BMI |
| if positiveBPL | if less than 128BPL |
| if overflow setBVS | if bit 6 set (64)BVS |
| if on overflow clearBVC | if bit 6 not setBVC |

So you see that you *do* have the power to make decisions, even though you're only dealing with memory locations and numbers less than 256. Of course terms like "overflow set" are probably completely alien so I've included beneath each term what the actual logic is.

Negative Number are all numbers greater than 127. 0 - 127 Are Positive. 128 - 255 = Negative. So as soon as you load that accumulator (or any other register with any number, the N (negative) flag is set for you. Coupled with the N flag are two commands:

BPL branch on plus and BMI branch on minus. In the case of BMI \$C132, the branch would occur only if the N flag was set, meaning the number in question was negative. These flags are also set by INY, DEY DEX, INX and most any command that changes a value either in memory or in a register. So when you branch based on a flag, you should be sure that the command used most recently hasn't changed any flags in ways that you don't want or expect. Usually the branch is used directly after that register is loaded or a BIT test has been made. Check this page for details on which commands affect which flags.

Taking the previous chart into account, we can write our little line mover in a number of different ways, not to exclude counting backwards, which is my favorite way of looping.

| C000: | LDY | #79 |
|-------|-----|--------|
| C002: | LDA | 1104,Y |
| C005: | STA | 1024,Y |
| C008: | DEY | |
| C009: | CPY | #255 |
| C00B: | BNE | \$C002 |
| C00D | RTS | |

But there's something wrong with this routine. I have a totally unnecessary command embedded. I could save a minimum of 160 cycles (160 millionths of a second) and make my code shorter t'boot if I use a different form of branching. There are a few automatic boons to machine language that I haven't used yet. Again, every time you deal with a number, flags are automatically set. Let's say you LOAD the ACCUMULATOR with 35, whether you loaded it directly or PEEKed the contents of a memory location. As soon as you do it one flag is set. The ZERO flag. 35 is not equal to zero. It is also considered an unsigned "positive" number (not greater than 127). The overflow flag is set simply if the number you're dealing with has the 64 bit set. So even though 128 is greater than 64, it won't set the overflow since the 64 bit isn't set:

```
128 = 1 0 0 0 0 0 0 0 0
128 64 32 16 8 4 2 1
N
```

FLAG TRIPPERS

As soon as you load the accumulator with 128, flags go off:

- 1. Not equal to zero Z flag
- 2. A "negative" number: N flag

Bearing these things in mind, let's rewrite that screen move routine:

```
C000: LDY #79

C002: LDA 1104,Y

C005: STA 1024,Y

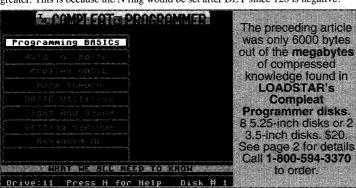
C008: DEY; affects N flag

C009: BPL $C002

C00B RTS
```

What? No comparison in the code? No need. Once Y is decremented past zero and it automatically wraps around to 255, the N flag is automatically set because Y is made greater than 127 at 255. So you KNOW that Y was just zero and you can stop.

Note that you can't use loops like this to move more than 129 bytes. This is because the loop would fall through on the first pass if Y were loaded with 129 or greater. This is because the N flag would be set after DEY since 128 is negative!



| al "Progra | mming Is | sue" | O P | age 5 | | |
|--|---|--------------------------|----------------------------|----------------------------------|--|--|
| Registe Addressing mode | | IZCID pcode by | | Re Regist Addressing mode | RTI turn from in ters affected: I Assembly form | terrupt VZCIDV opcode bytes cycles |
| immediate zero page | lda #oper lda oper | A9 2 A5 2 | 3 | implied | rti | 40 1 6 |
| zero page, x absolute | lda oper,x lda oper | B5 2 AD 3 | | Ret | RTS urn from sub | routine |
| absolute, x absolute, y | lda oper,x lda oper,y | BD 3 B9 3 | | Regisi Addressing mode | ers affected: I Assembly form | VZCIDV opcode bytes cycles |
| (indirect, x) | lda (oper,x) | A1 2 | 6 | implied | rts | 60 1 6 |
| (indirect), y | lda (oper),y | | 100 | Subtract men | SBC n from accumi | ilator with borrow |
| Register addressing mode | oad X regis s affected: N Assembly form o | ter ZCID scode byl | V es cycles | Regist Addressing mode immediate | ters affected: I Assembly form sbc #oper | lator with borrow NZCIBV curcide bytes cycles |
| immediate zero page | ldx #oper ldx oper | A2 2 A6 2 | | zero page zero page, x | sbc oper sbc oper,x | E5 2 3 F5 2 4 |
| zero page, y | ldx oper,y | B6 2 | 4 | absolute | sbc oper | ED 3 4 |
| absolute absolute, y | ldx oper ldx oper,y | AE 3 BE 3 | | absolute, x absolute, y | sbc oper,x sbc oper,y | FD 3 4* F9 3 4* |
| | LDY oad Y regis | ter | | (indirect, x) (indirect), y | sbc (oper,x) sbc (oper).v | E1 2 6 F1 2 5* |
| Register | oad Y regis s affected: N Assembly form o | ZCID scode byt | V es cycles | 765 | SEC | |
| immediate | ldy #oper | A0 2 | 2 | Regist Addressing mode | lers affected: I | ag NZCIDV opcode bytes cycles |
| zero page zero page, x | ldy oper ldy oper,x | A4 2 B4 2 | | implied | sec | 38 1 2 |
| absolute absolute, x | ldy oper ldy oper,x | AC 3 BC 3 | | | SED | node |
| Halves value | LSR 0-7 | 65465 | 110 - C | Regis Addressing mode | lers affected; I | node VZCIDV opcode bytes cycles |
| Shift right one Register Addressing mode | s affected: N | ZCID | nurator) V es rycles | implied | sed | F8 1 2 |
| accumulator | lsr a | 4A 1 | 2 | Set In | SEI terruot disa | ole status |
| zero page zero page, x | lsr oper lsr oper,x | 46 2 56 2 | | Regis Addressing mode | ters affected: I Assembly form | Die status VZ C1D V opcode bytes cycles |
| absolute | lsr oper | 4E 3 | 6 | implied | sei | 78 1 2 |
| absolute, x | lsr oper,x | | 75 J. 15 J. T. | Store | STA | in memory |
| I Register Addressing mode | No Operations affected: N | n ZCID | ٧ | Regis Addressing mode | lers affected. I Assembly form | in memory N Z C I D V opcode bytes cycles |
| implied | nop | EA 1 | _ | zero page zero page, x | sta oper sta oper,x | 85 2 3 95 2 4 |
| | ORA | | | absolute absolute, x | sta oper sta oper,x | 8D 3 4 9D 3 5 |
| OR Accu Register Addressing mode | s affected. N | n men ZCID | V S cycles | absolute, y | sta oper,y | 99 3 5 |
| immediate | ora #oper | 09 2 | 2 | (indirect, x) (indirect), y | sta (oper,x) sta (oper),y | 81 2 6 91 2 6 |
| zero page zero page, x | ora oper,x | 05 2 | | Store | STX | |
| absolute absolute, x | ora oper ora oper,x | 0D 3 1D 3 | | Regis Addressing mode | ters affected. I | n memory N Z C I D V opcode bytes cycles |
| absolute, y | ora oper,y | 19 3 | 3 4* | zero page | stx oper | 86 2 3 |
| (indirect, x) (indirect), y | ora (oper,x) ora (oper),y | | | zero page, y absolute | stx oper,y stx oper | 96 2 4 8E 3 4 |
| | PHA | | Strok | Store | STY | |
| Push (store Register Addressing mode | rs affected: N | ZCID | V S cycles | Regis Addressing mode | ters affected: | n memory N Z C I D V opcode bytes cycles |
| implied | pha | 48 | . 3 | zero page | sty oper | 84 2 3 94 2 4 |
| Push pro | PHP cessor state | | tack | zero page, x absolute | sty oper,x sty oper | 8C 3 4 |
| Push prod Register ddressing mode | s affected: N Assembly form o | Z C I D pcode byt | V s cycles | | XAT | |
| implied | php PLA | 08 | 3 | Regis | ters affected: | rto X register NZCIDV opcode bytes cycles |
| Pull Acc | umulator F | rom St | eck | implied | tax | AA 1 2 |
| Register Addressing mode | S affected: N Assembly form o | | | | YAT | |
| implied | pla PIP | 68 | 4 | Regis | ters affected: | r to Y register N Z C I D V opcode bytes cycles |
| Pull proce Register Addressing mode | | from | tack | implied | tay | A8 1 2 |
| | | | | | TSX | Ensular alla c |
| implied | plp 76543 | 28 1 250 — 0 | | Transfer : Regis | Stack pointe ters affected: | r to X register N Z C I D V opcode bytes, cycles |
| Rotate Left one Register Addressing mode | bit (memory | or acci | mulator) | implied | Assembly form tsx | BA 1 2 |
| Addressing mode accumulator | Assembly form o | pcode byt | es cycles 2 | | TXA | |
| zero page | rol oper | 26 2 | 2 5 | i ransfer Regis | A register to lers affected. | Accumulator N Z C I D V opcode bytes cycles |
| zero page, x absolute | rol oper,x rol oper | 36 2 2E 3 | 6 | implied | txa | 8A 1 2 |
| absolute, x | rol oper,x | 3E 3 | | | TXS | Stank politica |
| | C-765 e bit (memor) | or acci | (mulator) | Regis Adgressing mode | ters affected: Assembly form | Stack pointer NZCIDV opcode bytes cycles |
| Rotate right on Register Addressing mode | | | | implied | txs | 9A 1 2 |
| accumulator zero page | ror ror oper | 6A 66 | 5 | Transfer ' | TYA Y register to | Accumulator |
| zero page, x absolute | ror oper,x ror oper | 76 2 6E 3 | | Regist Addressing mode | ers affected:] Assembly form | Accumulator IZCIDV opcode bytes cycles |
| absolute, x | ror oper,x | 7E 3 | | implied | tya | 98 1 2 |

*Add one cycle if page boundary is crossed. For branching, add 2. Each cycle is roughly 1 millionth of a second. In order to use these commands, you need a machine language monitor or preferably an assembler. Both of these are provided in The COMPLEAT PROGRAMMER.

people who already own SwiftLink. So, we won't be including it. Thanks for your interest and I hope that we can look forward to delivering a Super CPU to you as soon as they are shipping.

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You, Your Commodore Computer, and the Internet, Part 5: Internet Electronic Mail

by Jim Brain. At the end of last class period, we were just delving into the simplest of all Internet services: electronic mail. Let us continue. Many of you have sent or received electronic mail, either via bulletin board systems, commercial services, or other means. Electronic mail is

simply a computerized version of regular paper mail. Every mail message has the following basic parts: Sender Address, Recipient Address, Message Body.

Like regular mail, Internet electronic mail (called e-mail or email) does not contain information on how to get the message from the sender to the recipient. Also, like its more traditional counterpart, email can be addressed in a variety of ways. However, it has a number of advantages over regular mail:

There is usually no charge to send or receive email. (The exception is CompuServe & MCI, which charge per kilobyte of mail read over a certain amount. The charge is trivial, but present.) Distance between source and destination is not a factor. (Even for CIS, the charge per kilobyte is the same no matter where the message came from.) Email is almost always faster. Most email arrives in 10 minutes or less, with 1 day being the maximum delivery time for almost all messages.

It's easy to send binary files and other non textual material in email messages Sending to multiple people does not require copying of message for each individual. The paper saved is arguably more environmentally friendly

Obviously, a few disadvantages include less personality (no special correspondence paper of fancy letterheads), computer/modem requirements, and less privacy. The last is important, as peeking at regular mail is considered a felony in many countries, but there is no such law in place for email. In fact, most email messages, if they must pass through a machine en route to their destination, are saved in areas that are easily accessible by those on that machine. Still, the sheer amount of email somewhat guarantees some element of privacy. However, if one is concerned about privacy, messages can be ciphered (just like playing detective when you were young).

Still, even with those drawbacks, Internet email is one of the most often used services of the Internet. In fact, almost all other Internet services can be accessed via email. An important advantage of email, of of the Internet in general, is its anonymity. That is, if you don't tell someone your email was sent with a Commodore computer, they'll never know. So, let's send some email.

To send a piece of email, you must know the address of the person

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you are sending the message to. Just like its traditional counterpart, an email address details exactly who the intended recipient is. For example:

Traditional Internet Description

Jim BrainbrainUsername 602 N. Lemenmailmachine Fentonmsendomain MI 48430comtop-level domain.

The addresses are organized like this:

TraditionalInternet

Jim Brainbrain@mail.msen.com 602 N. Lemen Fenton, MI 48430

Just as some people have addresses that omit the street address part, some Internet email addresses have no machine part.

Because so many people ask, there is NO directory of all email addresses. There are indeed catalogs of addresses available, but they are incomplete at best. At some point, we will such an exhaustive list, but not today.

The above addressing scheme is called the "Internet" style, and is most common. However, some systems still using UUCP (Unix to Unix Copy Program) instead of TCP/IP to transfer mail might use "bang" addresses. The above address in "bang" format would be:

mail.msen.com!brain

Speaking of "bang", Internet users have a shorthand way of pronouncing some symbols. These include:

!bang *star or splat .dot @at #hash

So, the address "brain@mail.msen.com" is pronounced: brain at mail dot msen dot com. Usually, a person must give you his or her email address via some other medium. However, for large commercial services, you can infer the Internet email address if you know the username:

GEnie JIMjim@genie.com DELPHIJIMjim@delphi.com Compuserve 12345,67812345.678@compuserve.com (note ',' to '.' change) AOLjim01jim01@aol.com Prodigyjimjim@prodigy.com

Note that Internet email addresses are not case sensitive. jim@mail.msen.com, Jim@mail.msen.com, and JIM@MAIL.msen.com are all the same.

Now, you'll need a mail client program to send mail. For shell users, PINE is a good choice. Here is the opening screen:

PINE 3.91 MAIN MENU

Folder: (CLOSED) 0 Messages

? HELP - Get help using Pine

C COMPOSE MESSAGE - Compose and send a message

I FOLDER INDEX - View messages in current folder

L FOLDER LIST - Select a folder to view

A ADDRESS BOOK - Update address book

S SETUP - Configure or update Pine

Q QUIT - Exit the Pine program

Copyright 1989-1994. PINE is a trademark of the University of Washington.

? Help P PrevCmd R RelNotes O OTHER CMDS L [ListFldrs] N NextCmd K KBLock

PINE is set up as a menu interface. You can select an option by using the cursor keys, the 'P' and 'N' commands, and the letter associated with each command. For example, typing 'I' brings up the following screen:

| F | PINE 3.91 | FOLDER INDEX | Folder: INBOX Message 1 of 23 NEW |
|---|--|---|--|
| 4 | N 1 Jan N 2 Jan N 3 Jan N 5 Jan N 5 Jan N 6 Jan N 7 Jan N 8 Jan N 10 Jan N 11 Jan N 11 Jan N 12 Jan N 13 Jan N 13 Jan | 30 Laura J. Mulcahy 30 Julie Joann Brain 30 Eric Mercer 30 NEUS#mimi@magic.it 30 Gordon Wilson 30 Dan Neuwirth 30 Johnny H. Lee (EXC 30 Kirkwood, Matt 30 M.W. Cottrell 30 TonyJess@aol.com 30 Laura J. Mulcahy 30 aaron@yahoo.com 30 John Bolhuis 30 Johny H. Lee (EXC | (1,555) Stolen with a screwdriver (1,246) Hi (728) RE: Stolen with a screwdriver (4,831) Commodore Trivia Edition #25 answers (2,422) Re: Re[2]: Is there someone??? (1,380) Re: Stolen with a screwdriver (2,282) RE: Roof repair advice (1,451) banner for magazine (1,421) Re: Roof repair advice (1,591) Screwdriver, part II (1,322) Yahoo Change (1,923) Re: Stolen Saturns (2,598) RE: Roof repair advice (2,598) Re: Stolen Saturns (2,598) Re: Roof repair advice |
| | N 16 Jan N 17 Jan N 18 Jan N 19 Jan ? Help | 30 Ray Prill 30 Chris Stanford 30 Machnik, Heather (30 Kyle Koppenhoefer M Main Menu P PrevMsg | (1,844) repairing plastic panels (2,938) Re: repairing plastic panels (1,230) Comments via Mosaic (1,191) Screwdriver, part II (2,045) Re: repairing plastic panels g - PrevPage D Delete R Reply g Spc NextPage U Undelete F Forward |

Replying to a message is as simple as selecting the message with the selection methods outlined earlier, and typing 'R'.

New users can find their way easily in PINE, but more advanced users might prefer other shell email programs. For them, elm, mh, and mail are provided.

OK, we are out of time. For your homework, I would like an email message from each class member. Address the message to brain@mail.msen.com and make the Subject:

"LOADSTAR TEST MESSAGE".

Jim Brain brain@mail.msen.com



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